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(54) Title: NOVEL 1-TRIACONTANOL DERIVATIVES

(57) Abstract

The present invention relates to novel 1-triacontanol derivatives of formula $[CH_3-(CH_2)_{29}-O-]_m-R$ wherein if m stands for 1, then R represents a group derived from a mono- or di- or oligosaccharide by removing the hydrogen atom from the hydroxyl group being in the 1(alpha) or 1(beta) position, or the O-protected, preferably acetylated derivative thereof, if m stands for 2, then R represents a group derived by removing a hydrogen atom attached to the carbon atom being in position 1 of the reaction product of glucose and mono-, di- or triethylene glycol or the O-protected, preferably O-acetylated derivative thereof.

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NOVEL 1-TRIACONTANOL DERIVATIVES

TECHNICAL FIELD

The present invention relates to novel 1-triacontanyl glycosides of formula I

$$[CH_3-(CH_2)_{29}-O-]_m-R \qquad (I)$$

wherein

if m stands for 1, then

R represents a group derived from a mono- or di- or oligosaccharide by removing the hydrogen atom from the hydroxyl group being in the 1(alpha) or 1(beta) position, or the O-protected, preferably acetylated derivative thereof,

if m stands for 2, then

R represents a group derived by removing a hydrogen atom attached to the carbon atom being in position 1 of the reaction product of glucose and mono-, di- or triethylene glycol or the O-protected, preferably O-acetylated derivative thereof.

The compounds of formula I of the invention are biologically active compunds and they are especially useful for the prevention and treatment of different diseases connected to aging.

1-Triacontanol, the primary alcohol having 30 carbon atoms, was separated and identified by Chibnall in 1933.

According to US patent specification No. 4,150,970 1-triacontanol is a growth regulator for plants. This activity is also supported by Science, Vol. 195, pages 1339 to 1341.

According to published European patent application No. 78,533 a topical pharmaceutical composition comprising 1-triacontanol as active ingredient is useful for treating skin disorders.

No reference has been made so far to the different sugar derivatives of 1-triacontanol.

The use of 1-triacontanol and the examination of the mechanism of its activity is very difficult as this compound is highly lipophylic and hardly dissolves in water.

To the contrary, the 1-triacontanol-glycosides of the present invention well dissolve in water and have a less apolar character.

DETAILED DESCRIPTION OF THE INVENTION

In the description under the term "monosaccharide" the aldopentoses and aldohexoses are understood. When m is 1, then the group derived from a monosaccharide by removing the hydrogen atom from the hydroxyl group being in the 1(alpha) or 1(beta) position may be ribosyl, arabinosyl, xylosyl, lixosyl, allosyl, altrosyl, glucosyl, mannosyl, gulosyl, idosyl, galactosyl, talosyl group from which the glucosyl group is preferred.

The protected derivatives thereof may be such groups wherein one or more, preferably all of the free hydroxy groups are substituted by a conventional protecting group. The most preferred protecting group is the acetyl group. The most preferred protected monosaccharide residue represented by R when

m = 1 is glucosyl tetraacetate.

Under the term "oligosaccharides" the bioses, such as lactose, genciobiose, laminaribiose, maltose, cellobiose and the maltoligomers, such as maltotriose, maltotetraose, maltopentaose, maltohexaose, maltoheptaose, maltooctaose are understood. When m is 1, then the group derived from an oligosaccharide by removing the hydrogen atom from the hydroxyl group being in the 1(alpha) or 1(beta) position is preferably lactosyl, cellobiosyl, maltosyl, maltotriosyl, maltotetraosyl, matopentaosyl, maltohexaosyl, maltoheptaosyl or maltoocaosyl group.

The protected derivatives thereof may be such groups wherein one or more, preferably all of the free hydroxy groups are substituted by a conventional protecting group. The most preferred protecting group is the acetyl group. The most preferred acetylated oligosaccharide residues represented by R when m=1 are cellobiosyl heptaacetate, lactosyl heptaacetate, maaltosyl heptaacetate, maltotriosyl decaacetate, maltotetraosyl tridecaacetate, maltohexaosyl nonadecaacetate, maltoheptaosyl dosocaacetate.

Thus a preferred group of compounds of formula I is that wherein

m is 1 and

R represents an aldopentosyl, aldohexosyl, biosyl or oligo-maltosyl group or the acetylated derivative thereof.

A more preferred group of compounds of formula I is wherein

m is 1 and

R represents glucosyl, lactosyl, cellobiosyl, maltosyl or

oligomaltosyl group or the acetylated derivative thereof.

The most preferred group of formula I is wherein

m is 1 and

R represents glucosyl, lactosyl, cellobiosyl, maltosyl, maltotriosyl, maltotetraosyl, maltopentaosyl, maltohexaosyl, maltoheptaosyl, maltooctaosyl, glucosyl tetraacetate, cellobiosyl heptaacetate, lactosyl heptaacetate, maltosyl heptaacetate, matotriosyl decaacetate, maltotetraosyl tridecaacetate, maltopentaosyl hexadecaacetate, maltohexaosyl nonaadecaacetate, maltoheptaosyl dosocaacetate, maltooctaosyl pentacosaacetate.

An other preferred group of formula I is wherein

m is 2 and

R represents 1,8-di-(beta-D-glucopyranos-6-yloxy-1-yl)-3,6-dioxaoctane, 1,5-di-(beta-D-glucopyranos-6-yloxy-1-yl)--3-oxapentane, 1,2-di-(beta-D-glucopyranos-6-yloxy-1-yl)--ethane, 1,8-di-(2,3,4-tri-O-acetyl-beta-D-glucopyranos-6-yloxy-1-yl)-3,6-dioxaoctane, 1,5-di-(2,3,4-tri-O--acetyl-beta-D-glucopyranos-6-yloxy-1-yl)-3-oxapentane, 1,2-di-(2,3,4-O-acetyl-beta-D-glucopyranos-6-yloxy-1-yl)-ethane.

Acute toxicity

The acute toxicity of the compounds according to Examples 1 to 21 was determined by using Turner's method (1965) on CFLP mice by oral administration. The results were evaluated by Litchfield-Wilcoxon's graphic method (1949). The LD_{50} value of all of the compounds of the invention was higher than 10 g/kg, it means that the compounds of the invention are not toxic.

Free radical scavenger activity

The free radical scavenger activity of the compounds of the invention was examined by the in vitro method of Imre Zs.-Nagy (Mech. Ageing Dev., 14, pages 245-251, 1980), i.e. the peptide polymerizing effect of -OH free radicals formed in the modified Fenton-reaction was examined in the presence of the compounds of the invention. Centrofenoxine (dimethylamino ethanol) and 1-triacontanol were used as comparative compounds.

According to the experiments the free radical scavenger activity of 1-triacontanolyl-maltoheptaoside (THM) significantly exceeds that of centroferoxine. In a concentration of 0.6 mmole THM was effective, while at the same concentration centrofenoxine was already ineffective. 1-Triacontanol was also not effective in the same concentration.

Antioxidant activity

The antioxidant activity of the compounds of the invention was examined on the basis of the in vitro test worked out by Stocks et al. (Clin. Sci. Mol. Med. 215-222, 223-233, 1974). In the above test the C_{50} value (that concentration which is necessary to reduce the initial autooxidation with 50 %) of the compounds was measured. The C_{50} value is characteristic for the antioxidant properties of the compound; the less is C_{50} the better radical scavenger the compound is. In the test THM inhibited the lipidperoxidation depending on its dose, its C_{50} value (that concentration wich is necessary to reduce the initial autoxidation with 50 %) was 0.56 mM.

According to the test results the comparative compounds did not influence the lipidperoxidation. At a concentration of

0.66 mM they reduced the initial autooxidation in an extent of less than 25 %.

The C_{50} value of vitamine E, which is generally used in therapy against pathological free radical reactions, is 0.45 mM.

The advantage of the compounds of the invention over vitamin E is that they are water and lipid soluble, while vitamin E is only lipid soluble.

The novel compounds of formula I are useful for the prevention or treatment of different diseases, especially those diseases which are connected to aging. Their significance is enhanced by the fact that the novel glycosides are not toxic, exert their activity at a low concentration and not only lipid but also water soluble.

Dosage forms suitable for internal administration contain from about 1 milligram to about 500 milligrams of active ingredient per unit. The dosage administered vary depending upon known factors such as the mode and route of administration, age, health and weight of the recipient; nature and extent of symptoms, kind of concurrent treatment, frequency of treatment, and the effect desired. In the oral and topica pharmaceutical compositions the active ingredient will ordinarily be present in an amount of about 0.5 to 95 % or 0.01 to 1 % by weight, respectively based on the total weight of the composition.

The pharmaceutical compositions comprising the compounds of the invention as active ingredient can be administered via any of the accepted modes of administration for therapeutic agents. These methods include oral, parenteral, transdermal, rectal, subcutaneous and other systemic modes. When the intended route of

administration is parenteral, the pharmaceutical composition should, of course, be in a sterile form.

Thus the compositions may be in the form of solid dosage forms such as capsules, tablets, coated tablets, powders, suppositories, ointments or liquid dosage forms such as syrups, emulsions, injections, elixirs, suspensions, emulsions, etc.

For solid compositions, conventional non-toxic solids include, for example, pharmaceutical grades of manitol, lactose, starch, magnesium stearate, sodium saccharin, talcum, cellulose, glucose, sucrose, magnesium carbonate, and the like may be used. The active compound may be formulated as suppositories using, for example, polyalkylene glycols, such as propylene glycol, as carrier.

Liquid dosage forms can, for example, be prepared by dissolving, dispersing, suspending, emulsifying, etc. an active compound and optional pharmaceutical adjuvants in an excipient, such as, for example, water, saline, aqueous dextrose, glycerol, ethanol and the like.

If desired, the pharmaceutical composition may also contain minor amounts of nontoxic auxiliary substances such as wetting agents, pH buffering agents, preservatives, flavouring agents, etc., for example, sodium acetate, sodium lauryl sulphate, sorbitan monolaurate, triethanolamine sodium acetate, triethanolamaine oleate, etc. Actual methods of preparing such dosage forms are known, or will be apparent, to those skilled in the art; see Remington's Pharmaceutical Sciences, Mack Publishing Company, Easton, Pa., 15th Edition, 1975.

The compounds of formula I are prepared by reacting 1-

triacontanol with the bromine derivative of the appropriate protected, preferably acetylated derivative of the corresponding saccharide (when m = 1) or with the bromine derivative of the corresponding protected, preferably acetylated crown-ether (when m = 2) preferably in the presence of a catalyst in an inert solvent or solvent mixture, then if desired, removing the protecting group(s).

In the course of glycosylation, the acetylated sugar can be used in a molar amount of 0.7-1.3 calculated for 1 mole of 1-triacontanol.

The reaction can be carried out at a temperature of 20-80°C, preferably at 50-60°C.

The glycosylation of 1-triacontanol in the generally suggested neutral solvents (e.g. chlorinated hydrocarbons, acetonitrile, nitromethane, N-dimethylformamide, dimethyl sulfoxide) cannot be carried out due to the low solubility of 1-triacontanol. According to our experiments a mixture of toluene and nitromethane can preferably used in the reaction as solvent.

The reaction can be facilitated by the presence of a catalyst. As catalyst, preferably mercury bromide, silver oxide, silver carbonate or mercury cyanide, most preferably mercury cyanide can be used.

When the reaction is carried out in the mixture of toluene and nitromethane in the presence of a catalyst at a temperature of 60°C, the reaction can be completed within some hours.

At the end of the glycosylation the product thus obtained can be purified in a manner known per se, e.g. by

recrystallization or coloumn chromatography or the acetyl groups can be removed.

The removal of the acetyl groups can be carried out by conventional techniques, such as splitting off with the aid of sodium methylate.

The invention is further illustrated by the following, non-limiting examples.

Example 1

1-Triacontanyl-tetra-O-acetyl-beta-D-glucopyranoside

From a mixture of 300 mg (0.94 mmoles) of 1-triacontanol, 400 mg (1.583 mmoles) of mercury cyanide, 20 ml touene and 20 ml of nitromethane the half of the solvent is distilled off under atmospheric pressure. The residue is cooled to a temperature of 60 ^{o}C and 411 mg (1 mmole) of alpha-acetobrom-D-glucose are added and the mixture is stirred for 5 hours at the same temperature.

Then the mixture is cooled to a temperature of 18-20^{o}C, 50 ml of butanol are added, the mixture is filtered and evaporated. The residue is taken up with 100 ml of toluene and the solution is washed with 2x30 ml of 5 % by weight aqueous potassium iodide solution then with 2x30 ml of water. Then it is dried over sodium sulphate and evaporated. The crude product is recrystallized from ethyl acetate.

Yield: 220 mg (41.8 %)

Melting point: 80 ^{o}C.

R_f : 0.63 (in a 95:5 mixture of dichloromethane and acetone)

alpha $^{20}_{D}$ = -5.1 ^{o}C (c=0.25 ; toluene)

Example 2

1-Triacontanyl-beta-D-glucopyranoside

150 mg of product prepaared according to the previous example are suspended in a mixture of 15 ml of methanol and 15 ml of n-butanol. Then 10 mg of sodium methylate are added and the reaction mixture is boiled for 5 hours. The hot solution is neutralized with the aid of Amberlite IR-120(H^+) resin, filtered then evaporated after cooling. The desacetylated product is crystallized from methanol.

Yield: 100 mg (85.3 %)

Melting point: 94 ^oC.

Example 3

1-Triacontanyl-hepta-O-acetyl-beta-cellobioside

300 mg (0.94 mmoles) of 1-triacontanol are reacted with alpha-acetobromo cellobioside and worked up according to the method described in Example 1. The product is crystallized from ethyl acetate.

Yield: 407 mg (56.3 %)

Melting point: 120-128 ^oC.

R_f : 0.34 (in a 95:5 mixture of dichloromethane and acetone)

alpha $^{20}_D$ = -15.6^o (c=0.28 ; toluene)

Example 4

1-Triacontanyl-beta-cellobioside

300 mg of product obtained in the previous example are desacetylated in a mixture of 303 ml of methanol and 30 ml of n-butanol according to the method described in Example 2. The product is crystallized from 20 ml of methanol.

Yield: 195 mg (90.1 %)

Melting point: 128-138 ^oC

Example 5

1-Triacontanyl-hepta-O-acetyl-beta-lactoside

300 mg (0.94 mmoles) of 1-triacontanol are reacted with alpha-acetobromo lactose and worked up according to the method described in Example 1. The product is purified by coloumn chromatography (column: Kieselgel 0.063-0.2 mm; eluent: a 85:15 mixture of dichloro methane and acetone).

Yield: 571 mg (61 %)

alpha $^{20}_{D}$ = -4.2 ^{o} (c=0.57 ; toluene)

Example 6

1-Triacontanyl-beta-lactoside

300 mg of product obtained in the previous example are desacetylated in a mixture of 30 ml of methanol and 30 ml of n-butanol according to the method described in Example 2. The product is crystallized from methanol.

Yield: 190 mg (87.8 %)

Melting point: 166-170 ^{o}C

Example 7

1-Triacontanyl-hepta-O-acetyl-beta-maltoside

106.2 mg (1.3 mmoles) of 1-triacontanol are reacted with 200 mg of alpha-acetobromo-maltose in accordance with Example 1. The crude product is purified by column chromatography (column: Kieselgel 0.063-0.2 mm; eluent: a 2:2:1 mixture of toluene, dichloro methane and acetone). The glycoside acetate thus obtained is recrystallized from methanol.

Yield: 157 mg (51.9 %)

Melting point: 82-87 ^{o}C.

alpha $^{20}_{D}$ = +26.3^{o} (c=0.22 ; toluene)

R_f : 0.74 (in a 2:2:1 mixture of toluene, dichloromethane and acetone)

Example 8

1-Triacontanyl-deca-O-acetyl-beta-maltotrioside

318.7 mg (1 mmole) of 1-triacontanol are reacted with 840 mg of alpha-acetobromo-maltose in accordance with Example 1. The crude product is purified by column chromatography (column: Kieselgel 0.063-0.2 mm; eluent: a 2:2:1 mixture of toluene, dichloro methane and acetone). The glycoside acetate thus obtained is recrystallized from methanol.

Yield: 370 mg (32.8 %)

Melting point: 77.79 °C.

alpha $^{20}_D$ = +66.1° (c=0.29 ; toluene)

R_f : 0.63 (in a 2:2:1 mixture of toluene, dichloromethane and acetone)

Example 9

1-Triacontanyl-beta-maltotrioside

300 mg of product obtained in the previous example are desacetylated in a mixture of 30 ml of methanol and 30 ml of n-butanol according to the method described in Example 2. The product is recrystallized from methanol.

Yield: 134 mg (64.9 %)

Melting point: 88-100 °C

Example 10

1-Triacontanyl-tridecaa-O-acetyl-beta-maltotetraoside

218.7 mg (1 mmole) of 1-triacontanol are reacted with 1.0 g (0.783 mmoles) of alpha-acetobromo-maltotetraose according to Example 1. After working up the reaction mixture and separating

the product by column chromatography the product is recrystallized from methanol.

Yield: 326 mg (25.5 %)

Melting point: 81-83 °C.

R_f : 0.55 (in a 2:2:1 mixture of toluene, dichloromethane and acetone)

alpha $^{20}_D$ = +31.6° (c=0.22 ; toluene)

Example 11

1-Triacontanyl-beta-maltotetraoside

400 mg of crude product obtained in the previous example are desacetylated in a mixture of 30 ml of methanol and 30 ml of n-butanol according to the method described in Example 2. The product is recrystallized from methanol.

Yield: 144 mg (54 %)

Melting point: 80-88 °C

Example 12

1-Triacontanyl-hexadeca-O-acetyl-beta-maltopentaoside

225 mg (0.8 mmole) of 1-triacontanol are reacted with 1.05 g of alpha-acetobromo-maltopentaose according to Example 1. After working up the reaction mixture and separating the product by column chromatography the product is recrystallized from methanol.

Yield: 515 mg (39.9 %)

Melting point: 76-79 °C.

alpha $^{20}_D$ = +71.6° (c=0.35 ; toluene)

Example 13

1-Triacontanyl-beta-maltopentaoside

370 mg of product obtained in the previous example are

desacetylated in a mixture of 30 ml of methanol and 30 ml of n-butanol according to the method described in Example 2. The product is washed with methanol and dried on air.

Yield: 234 mg (97.3 %)

Melting point: 150-158 °C

Example 14

1-Triacontanyl-decosaa-O-acetyl-beta-maltoheptaoside

219.4 mg (0.69 mmole) of 1-triacontanol are reacted with 1 mmole of alpha-acetobromo-maltoheptaose according to Example 1. The product is recrystallized from ethanol.

Yield: 250 mg (20 %)

Melting point: 80 °C.

alpha $^{20}_{D}$ = +75.9° (c=0.16 ; toluene)

R_f : 0.32 (in a 85:15 mixture of dichloromethane and acetone)

Example 15

1-Triacontanyl-beta-maltoheptaoside

150 mg of product obtained in the previous example are desacetylated in a mixture of 50 ml of methanol and 50 ml of n-butanol according to the method described in Example 2. The product is recrystallized from methanol.

Yield: 57.5 mg (90.1%)

Melting point: 160-168 °C

Example 16

1-Triacontanyl-monodeca-O-acetyl-beta-maltohexaoside

318.7 mg (1 mmole) of 1-triacontanol are reacted with 1.61 g (0.869 mmole) of alpha-acetobromo-maltohexaose according to Example 1. After working up the reaction mixture and separating the product by column chromatography the product is

recrystallized from methanol.

Yield: 420 mg (21.9 %)

Melting point: 82-85 °C.

alpha $^{20}_{D}$ = +71.9° (c=0.26 ; toluene)

R_f : 0.42 (in a 2:2:1 mixture of toluene, dichloromethane and acetone)

Example 17

1-Triacontanyl-beta-maltohexaoside

450 mg of product obtained in the previous example are desacetylated in a mixture of 30 ml of methanol and 30 ml of n-butanol according to the method described in Example 2. The product is recrystallized from methanol.

Yield: 218 mg (75.8 %)

Melting point: 163-166 °C

Example 18

1-Triacontanyl-pentacosa-O-acetyl-beta-maltooctaoside

318.7 mg (1 mmole) of 1-triacontanol are reacted with 2.28 mg (0.938 mmole) of alpha-acetobromo-maltooctaose according to Example 1. After working up the reaction mixture and separating the product by column chromatography the product is recrystallized from methanol.

Yield: 127 mg (4.9 %)

Melting point: 103-104 °C

alpha $^{20}_{D}$ = +76.9° (c=0.17 ; toluene)

R_f : 0.34 (in a 2:2:1 mixture of toluene, dichloromethane and acetone)

Example 19

1-Triacontanyl-beta-maltooctaoside

100 mg of product obtained in the previous example are desacetylated in a mixture of 30 ml of methanol and 30 ml of n-butanol according to the method described in Example 2. The product is recrystallized from a small amount of methanol.

Yield: 44 mg (70.6 %)

Melting point: 200-206 °C

Example 20

1,8-di-(triaakont-1-yl-2,3,4-tri--O-acetyl-beta-D-gluocopyrazos-6-yloxy)-3,6-dioxaoctane

760 mg (1.7 mmoles) of 1-triacontanol are dissolved in a mixture of 30 ml of dry toluene and 30 ml of nitromethanae, then the mixture is evaporated to the half of its volume by azeotropic distillation. Then 525 mg (2.07 mmoles) of powdered mercury (II) cyanide and 670 mg (0.78 mmole) of 1,8-di(1-bromo-1-deoxy-2,3,4-tri-O-acetyl-beta-D-glucopyrazos-6-yloxy)-3,6-dioxaoctane are added. The reaction mixture is stirred at a temperature of 60 °C for 2 hours. The two products detectable by thin-layer chromatography (R_f = 0.56 and 0.14, respectively in a 9:1 mixture of dichloro methane and acetone) are separated by column chromatography and recrystallized from toluene.

Yield: 586 mg (38 %)

Melting point: 76-78 °C

R_f : 0.56(in a 9:1 mixture of dichloromethane and acetone)

alpha $^{20}_D$ = -1.35° (c=0.148 ; toluene)

Example 21

1,8-di-triacont-1-yl-beta-D-glucopyranos-6-yloxy)-3,6-dioxaoctane

336 mg (0.21 mmole) of product obtained in the previous example are dissolved in a mixture of 40 ml of dry methanol and

20 ml of dry toluene and the mixture is stirred in the presence of catalytic amount of sodium methylate at a temperature of 50 °C. The reaction mixture is neutralized with the aid of Amerlite IR-120 (H^+) resin, filtered off and the filtrate is evaporated. The product is triturated with n-hexane, thus white, cristalline product is obtained.

Yield: 220 mg (78 %)

Melting point: 89-91 °C

alpha $^{20}_D$ = -62.49 (c=0.05 ; toluene)

Example 22

Tablet

Compound of Example 9	10 mg
microcrystalline cellulose	50 mg
corn starch	20 mg
talcuum	20 mg
	100 mg

Example 23

Capsule

Compound of Example 15	5 mg
lactose	50 mg
corn starch	25 mg
talcuum	15 mg
magnesium stearate	5 mg
	100 mg

Example 24

Ointment

Compound of Example 6	0.020 % by weight
methylparabene	0.025 % by weight

propylparabene	0.015 % by weight
sodium lauryl sulfate	1.000 % by weight
propylene glycol	12.000 % by weight
stearyl alcohol	25.000 % by weight
white petrolatum	25.000 % by weight
purified water	37.000 % by weight

Patent claims

1. 1-Triacontanyl glycosides of formula I

$$\left[CH_3-(CH_2)_{29}-O-\right]_m-R \qquad (I)$$

wherein

if m stands for 1, then

R represents a group derived from a mono- or di- or oligosaccharide by removing the hydrogen atom from the hydroxyl group being in the 1(alpha) or 1(beta) position, or the O-protected, preferably acetylated derivative thereof,

if m stands for 2, then

R represents a group derived by removing a hydrogen atom attached to the carbon atom being in position 1 of the reaction product of glucose and mono-, di- or triethylene glycol or the O-protected, preferably O-acetylated derivative thereof.

2. The compounds according to claim 1 wherein

m is 1 and

R represents an aldopentosyl, aldohexosyl, biosyl or oligomaltosyl group or the acetylated derivative thereof.

3. The compounds according to claim 1 or 2 wherein

m is 1 and

R represents glucosyl, lactosyl, cellobiosyl, maltosyl or oligomaltosyl group or the acetylated derivative thereof.

4. The compounds according to any of claims 1 to 3 wherein

m is 1 and

R represents glucosyl, lactosyl, cellobiosyl, maltosyl, maltotriosyl, maltotetraosyl, maltopentaosyl, maltohexaosyl, maltoheptaosyl, maltooctaosyl, glucosyl tetraacetate, cellobiosyl heptaacetate, lactosyl heptaacetate, maltosyl heptaacetate, matotriosyl decaacetate, maltotetraosyl tridecaacetate, maltopentaosyl hexadecaacetate, maltohexaosyl nonaadecaacetate, maltoheptaosyl dosocaacetate, maltooctaosyl pentacosaacetate.

5. The compounds according to any of claims 1 to 4 wherein

m is 2 and

R represents 1,8-di-(beta-D-glucopyranos-6-yloxy-1-yl)-3,6-dioxaoctane, 1,5-di-(beta-D-glucopyranos-6-yloxy-1-yl)--3-oxapentane, 1,2-di-(beta-D-glucopyranos-6-yloxy-1-yl)--ethane, 1,8-di-(2,3,4-tri-O-acetyl-beta-D-glucopyranos-6-yloxy-1-yl)-3,6-dioxaoctane, 1,5-di-(2,3,4-tri-O--acetyl-beta-D-glucopyranos-6-yloxy-1-yl)-3-oxapentane, 1,2-di-(2,3,4-O-acetyl-beta-D-glucopyranos-6-yloxy-1-yl)-ethane.

6. Process for the preparation of compounds of formula I

wherein

if m stands for 1, then

R represents a group derived from a mono- or di- or oligosaccharide by removing the hydrogen atom from the hydroxyl group being in the 1(alpha) or 1(beta) position, or the O-protected, preferably acetylated derivative thereof,

if m stands for 2, then

R represents a group derived by removing a hydrogen atom attached to the carbon atom being in position 1 of the reaction product of glucose and mono-, di- or triethylene glycol or the O-protected, preferably O-acetylated derivative thereof

which comprises reacting 1-triacontanol with the bromine derivative of the appropriate protected, preferably acetylated derivative of the corresponding saccharide (when m = 1) or with the bromine derivative of the corresponding protected, preferably acetylated crown-ether (when m = 2) preferably in the presence of a catalyst in an inert solvent or solvent mixture, then if desired, removing the protecting group(s).

7. A process as claimed in claim 6 which comprises using toluene and nitromethane as solvent in the glycosilation reaction.

8. A process as claimed in claim 6 or 7 which comprises using mercury bromide, silver oxide, silver carbonate or mercury cyanide, preferably mercury cyanide as catalyst.

9. A process as claimed in any of claims 6 to 8 which comprises carrying out the reaction at a temperature of 20 to 80

°C, preferably at 50 to 60 °C.

INTERNATIONAL SEARCH REPORT

International Application No PCT/HU 90/00082

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [8]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl.[5]: C 07 H 15/04// A 61 K 31/70

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
Int. Cl.[5]:	C 07 H 15/00

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y	SOVIET PATENTS ABSTRACTS, Section Ch, week 8925, issued 1989, August 02 DERWENT PUBLICATIONS LTD., London, B03 *SU 1428-755-A (AS USSR FAR E RES)*	(1-9)
Y	EP, A1, 0 132 043 (THE PROCTER & GAMBLE COMPANY) 23 January 1985 (23.01.85), see claims 1,2.	(1-9)
Y	EP, A2, 0 144 894 (BAYER AG) 19 June 1985 (19.06.85), see claim 1.	(1-9)
A	EP, A1, 0 132 046 (THE PROCTER & GAMBLE COMPANY) 23 January 1985 (23.01.85), see claims 1,4,5.	(1-9)

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* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
04 March 1991 (04.03.91)	15 March 1991 (15.03.91)
International Searching Authority	**Signature of Authorized Officer**
AUSTRIAN PATENT OFFICE	

Form PCT/ISA/210 (second sheet) (January 1985)

Anhang zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

Annex to the International Search Report on International Patent Application No. PCT/HU 90/00082

Annexe au rapport de recherche internationale relatif à la demande de brevet international n°.

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben. Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned International search report. The Austrian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

La présente annexe indique les membres de la famille de brevets relatifs aux documents de brevets cités dans le rapport de recherche internationale visé ci-dessus. Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office autrichien des brevets.

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